

# MC 500

Five Hundred Watt  
Multiple-Channel  
Amplifier



**Thank you for purchasing a Soundstream amplifier. You now own the finest high power amplifier available, a precision component capable of audiophile-quality performance.**

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Figure 1 2-Channel Operation

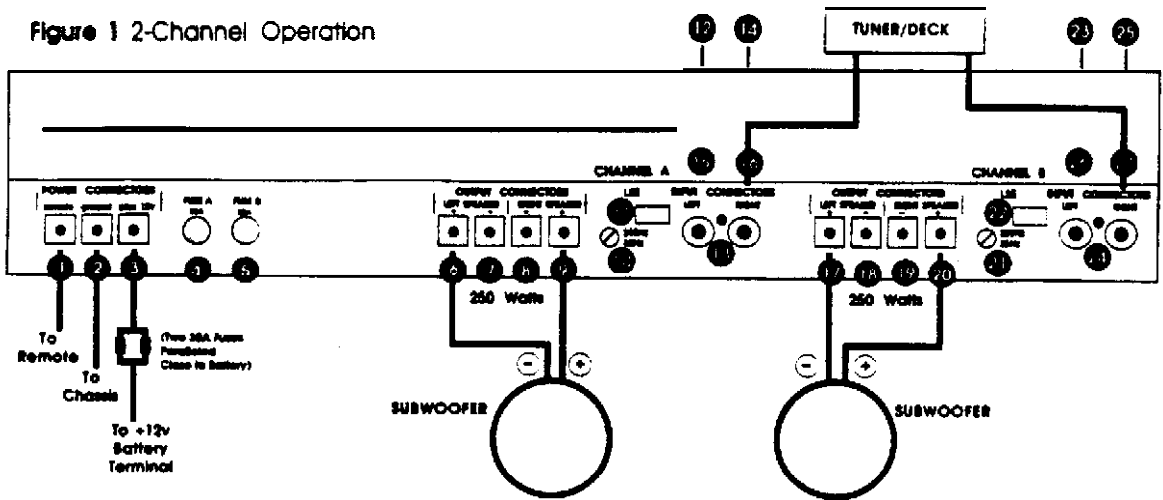


Figure 2 3-Channel Operation

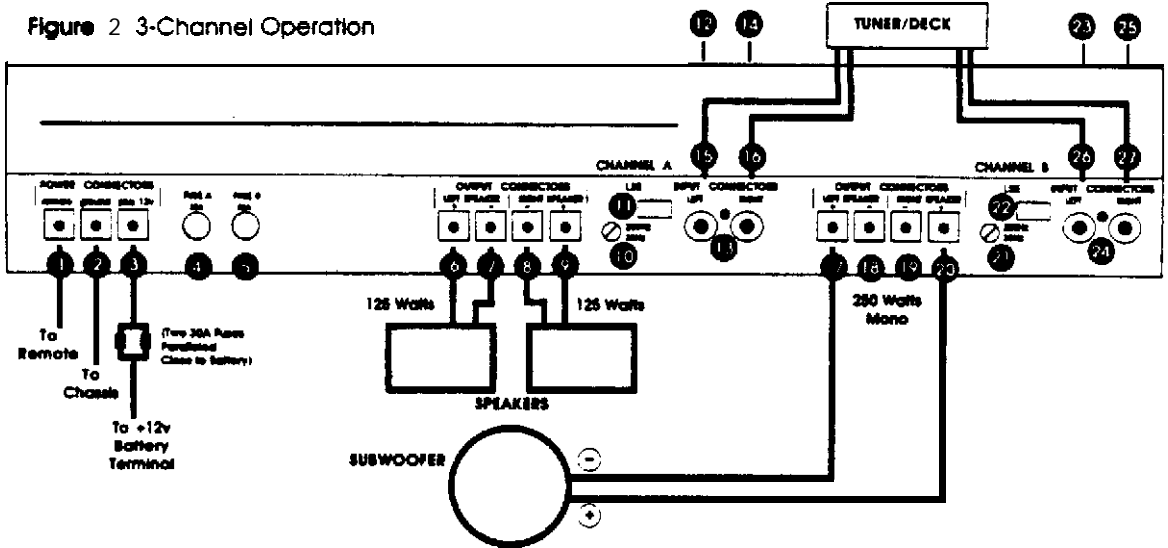
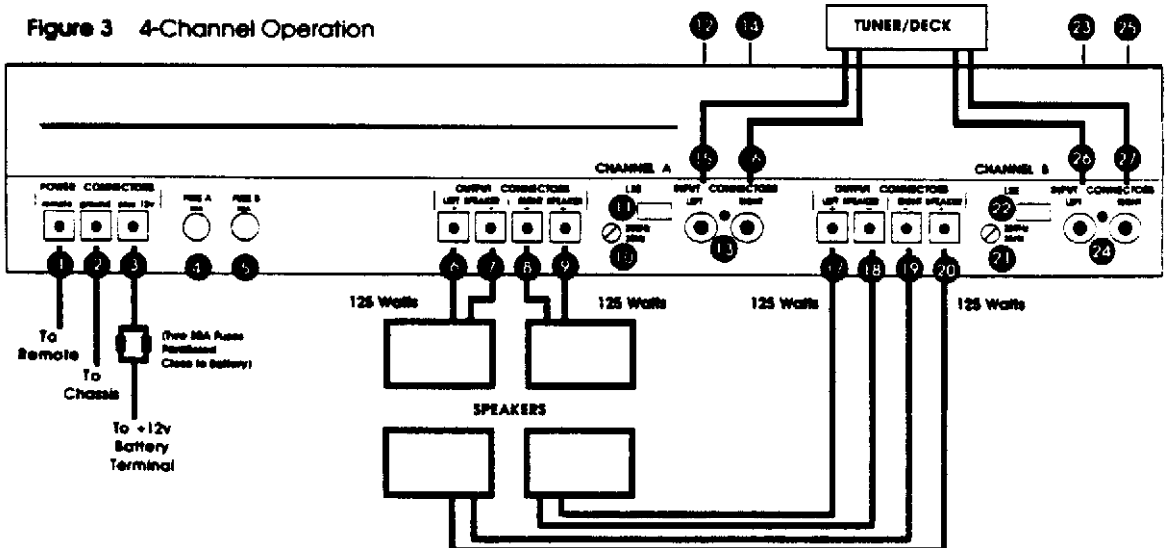


Figure 3 4-Channel Operation



## DESIGN FEATURES

**The Soundstream MC500 is the ultimate amplifier for high-power automotive applications.**

**The MC500 is conservatively rated at 500 watts into 4 ohms. This power can be divided into four channels (4 x 125 watts.), three channels (2 x 125 watts, 1 x 250 watts), or stereo (2 x 250 watts). Each output device is individually rated at 125 watts, and there are 24 discrete output devices in the MC500, for a total of 3 kilowatts of device capability. With such reserves and no current limiting, the MC500 operates without strain even at maximum output. Power, ground, and speaker connectors are rated to handle up to 80 amps and up to 6 gauge wire.**

**The MC 500 incorporates a unique protection system that prevents thermal overload without the need for a fan. Should the unit approach an overheated condition, dynamic headroom is reduced instead of a complete shutdown, until normal operating temperature is reached. Then full output capacity is restored. The entire process is automatic and inaudible. In the case of a malfunction which should cause continued overheating, secondary thermostats will shut down the amplifier in a conventional manner.**

**An especially useful feature of the MC500 is the Linear Subwoofer Extension Circuit (LSE), which compensates for the natural rolloff of most speakers and extends bass as much as a full octave. LSE provides a linear boost of 6 dB/octave, starting at a point which is continuously variable over the range 35-280 Hz. A steep 24 dB/octave filter attenuates the signal below 20 Hz.**

**Only premium parts are used in the MC500, such as metal-film resistors, gold-plated input connectors, and immersible sealed potentiometers. The case is equipped with generous heat sinks. Input sensitivity is adjustable to match any tuner/deck--the MC500 can even be used as a power booster.**

The MC500 features dual-monaural construction, with two fully independent soft regulated pulse-width modulated power supplies that provide stability for low-impedance reactive loads (down to 2 ohms/4 channel operation) and still allow greater than 2 dB IHF dynamic headroom. All gain devices are biased by regulated active current sources, so that even low-frequency performance is unaffected by supply-line noise and temperature fluctuations.

## **INSTALLATION**

Proper installation and adjustment will reward you with reliable operation and optimum performance. Automotive sound system installations can be tricky, especially for first timers. For this reason, you may want to consider using a professional installer who has the tools and, more importantly, the experience, to do the job right. If you decide to install your equipment yourself, we hope that this manual will serve as a helpful guide.

### **Location and mounting**

The first step in installation is thorough planning. Choose the location for your amplifier carefully. The amplifier should be located in either the passenger compartment or the trunk, never in the engine compartment or in any outside location exposed to dirt and moisture. Adequate ventilation is important; allow enough space so that air can circulate around the heat sinks.

Make sure that the installed amplifier will not interfere with normal operation of the car. It is best not to locate the amplifier near your antenna, because the switching power supply can interfere with AM reception.

Your amplifier should be mounted firmly to your car's sheet metal with the four screws provided. Use your amplifier as a template for making pencil-marks where you intend to drill. (Do not operate your drill through these mounting holes.)

It's a good idea to bench test your system before mounting the components. If you have a 12-volt power source, you can connect and test all the components outside the car. Or you can connect them inside the car before screwing them down. Either way, connect the components exactly as you intend to in the final installation: make all power connections last; test the system; then disconnect all power until the final installation is complete.

### Wiring

Determine how your car's wiring is laid out, and run your wires in the same locations when possible. Many passageways, wire-hooks, and strain relief devices already exist in your car; take advantage of them. Keep all wiring inside the car. Good standard audio practice suggests keeping signal wires short and away from power lines. Wires can be run under carpet. If you drill a new passage-hole through metal, make sure no burrs remain to scrape the wire; use grommets as needed. All wires should be hidden; an exposed wire can inadvertently be pulled, causing disconnection or shorting. Wires should never be under tension or subject to moisture. Use cable ties to bundle excess wire.

### **POWER CONNECTIONS**

**NOTE:** Your amplifier can only be operated from a 12-VOLT NEGATIVE GROUND electrical system. If your car was produced before 1970, or if you have any doubts, make sure of the type of electrical system you have before making any connections.

The MC500 will draw up to 70 amperes if used to its fullest capability. Determine the alternator rating of your car and the current consumption of the car's other accessories. It may be necessary to upgrade the alternator or to install a separate battery, especially in cold climates.

For power wiring, use 8-gauge wire or larger. (Smaller gauge numbers denote larger wire.) The (PLUS 12V) terminal (<3> in the wiring diagram) should be connected directly to the positive (+) terminal of your car battery. Install two (2) 30 amp fuses (in parallel) in the line close to the battery terminal. If you have more than one amplifier, each amplifier should be separately fused.

The <GROUND> terminal <2> should be connected directly to the automobile chassis with 8-gauge wire or larger. Make this wire as short as possible to prevent noise in the system. A nearby bolt can serve as a ground terminal. Make sure that the wire contacts bare metal, not coated metal or paint. It is important that the ground connection you select have minimal noise resistance to the battery ground post (a maximum of 0.1 ohm).

#### REMOTE POWER-ON CONNECTION

If your tuner/deck has a remote power-on control wire or terminal, connect it to the <REMOTE> terminal <1> on your amplifier. This is a control line, not a power line, so small wire (18-20 gauge) is acceptable.

If your tuner/deck has no remote power-on control labeled as such, but has a power antenna control, it may be possible to wire the power antenna control to the (REMOTE) terminal.

If your tuner/deck has neither a remote power-on control wire nor a usable power antenna control, it will be necessary either to connect the <REMOTE> terminal to a +12 volt source which is switched by the ignition key, or to connect the (REMOTE) terminal to a constant t12 volt source through an on-off switch you install in series with the ignition switch in a location accessible to the driver.

### LED POWER INDICATORS

The two main channels of the MC500 (A and B) are completely independent, and each has its own LED indicating power-on: <13> for main CHANNEL A, and <24> for main CHANNEL B. Since power should be disconnected during installation, these LEDs should be dark until you are finished! Both LEDs will go out if the power-line fuses are blown; if a chassis fuse is blown, only the LED for that amplifier section will go out.

### SELECTING OPERATING MODE

The five hundred watts available from the MC500 can be divided into two channels (stereo) [Figure 11, three channels (stereo plus a single-channel subwoofer) [Figure 2], or four channels (front and rear stereo; or stereo bi-amp) [Figure 3].

To select any of these modes, remove the plug covers marked CHANNEL A and CHANNEL B on the bottom of the amplifier switch.



**For two-channel operation, set both switches to <MDNO>.**

**For three-channel operation, set one switch to <STEREO> and the other to (MDNO). Note carefully which is which, because you must connect wires accordingly.**

**For four-channel operation, set both switches to <STEREO>.**

## INPUT CONNECTIONS

**Inputs to the amplifier attach by means of standard RCA-type jacks. The MC500 achieves a level of performance at which cable and connector quality is significant; the jacks on your amplifier are gold plated, and we recommend premium gold-plated plugs and high-quality shielded cable.**

**In most cases, the signal source will be the preamp output jacks of a tuner/deck. Some tuner/decks use preamp output connectors other than RCA jacks, in which case you will need a special cable or adaptor available from your dealer.**

**If your tuner/deck has speaker outputs and no preamp outputs, you can use the speaker outputs. Wire RCA-type plugs to the ends of your tuner/deck's output wires, making sure that you maintain consistent polarity in all channels.**

**If you have an equalizer or low-level crossover network(s) for bi-or tri-amping, these components will be inserted between your tuner/deck and your amplifier(s). Refer to the manuals for these components for further details.**

**In 4-channel mode, all four input jacks <15>, <16>, <26>, and <27> are active for CHANNEL A left and right and CHANNEL B left and right, respectively.**

**In Z-channel mode, use only the "right" jack <16> for CHANNEL A, and only the "right" jack <27> for CHANNEL B.**

In 3-channel mode, use only the "right jack for whichever of main CHANNEL A or CHANNEL B is operating in mono, and both jacks for the other main channel.

## **OUTPUT CONNECTIONS**

Use high-quality loudspeaker cable for best results; use 14-gauge cable as a minimum size.

In 4-channel mode, all four terminals <6>, <7>, <8>, and <9> are active for main CHANNEL A, and all four terminals <17>, <18>, <19>, and <20> are active for main CHANNEL B.

In 2-channel mode, use only the "+" terminals <17> and <20> for CHANNEL B. The "+ right" terminals <9> and <20> have positive polarity in this mode.

In 3-channel mode, use only the "+" terminals for whichever of main CHANNEL A or CHANNEL B is operating in mono, and all four terminals for the other main channel.

The terminals on your loudspeakers are marked for polarity, and loudspeaker wire is coded by color or by markings on the jacket. Be sure to connect the left and right channels with the same polarity. Loudspeaker manufacturers are not consistent in their polarity markings, so if you have loudspeakers of different types connected to the same amplifier terminal, verify correct polarity by ear. The correct polarity produces the most bass; incorrect polarity produces less bass and a strangely dislocated sound image on mono material.

If you have more than one amplifier: for each amplifier and its loudspeakers. the left and right channels must always be wired with the same polarity. But from one amplifier to the next, correct polarity may be the same, or it may be

reversed. This is because of differences in amplifier design, the nature of crossover filters, and other factors. Again, experiment and verify the correct polarity by ear.

#### OPTIMIZING FOR SPEAKER IMPEDANCE

As delivered from the factory, your MC500 has been optimized for 4 ohm operation. It is possible to optimize this amplifier to deliver maximum performance into 2-, 4-, or 8-ohm loudspeakers. This is done by means of plug-in fuses behind a door on the bottom of the amplifier.

Remove the screw in the door and pop the door open, and you will see four receptacles: two for CHANNEL A and two for CHANNEL B. Two fuses will already be installed in one of the receptacles for each channel. To optimize the MC500 impedance, move the appropriate pair of fuses for each channel. Note that the fuse (pair) positions will optimize main CHANNEL A or CHANNEL B for 4 or 2 ohms in 4-channel mode (or for the 2-channel half in 3-channel mode); or for 8 or 4 ohms in bridged (mono) mode. If you are unsure of the impedance of your speakers, or are wiring more than ~~one~~ one speaker to a set of terminals, consult your dealer or installer for the best settings.

#### INPUT LEVEL ADJUSTMENT

Input levels are adjusted by means of four independent controls that are accessible through the heat sink directly above the input connectors. The controls can be turned with a small, flat-head screwdriver.

In 4-channel mode, the left and right halves of CHANNEL A are set by controls <12> and <14>, respectively; the left and right halves of CHANNEL B are set by controls <23> and <25>.

In 2-channel mode, only the "right" control <14> is operative for CHANNEL A, and only <25> for CHANNEL B.

In 3-channel mode, use only the "right" control for whichever of main CHANNEL A or CHANNEL B is operating in mono, and both controls for the other main channel.

Depending on how you are using your MC500 (number of channels, bi-amplification, associated equipment, etc.), different factors may apply for optimum gain settings. In general, begin by turning all level controls to minimum (full counter-clockwise). Turn the system on, and set the volume control on your tuner/deck at its mid-point. Advance the amplifier input level controls until you have reached a comfortable listening level and both channels are in balance. NOTE: with many tuner/decks, the radio output level is significantly different than the tape output level. Check both sources, and set levels using the lesser of the outputs (usually the tape).

#### LINEAR SUBWOOFER EXTENSION CIRCUIT (LSE)

The LSE circuit will compensate for the natural rolloff of most loudspeakers, and can extend deep bass by as much as a full octave. For CHANNEL A, LSE is engaged by pressing switch <11>, and the frequency is adjusted by control <10>. For CHANNEL B, LSE is engaged by pressing switch <22>, and the frequency is adjusted by control <21>. If either CHANNEL A or CHANNEL B is operating in stereo, LSE will be applied to both left and right.

The control allows for continuously variable adjustment, over the range from 35 Hz to 280 Hz, of the frequency at which LSE begins its boost. Below the chosen frequency, the boost is applied at 6 dB per octave. When properly adjusted, LSE will "linearize" the low end of the woofer(s) and provide remarkably smooth and deep bass. A word of caution: small or inexpensively constructed woofers may be unable to handle the equalization which results from setting the LSE to above 100 Hz.

## PROTECTION CIRCUITS

Your amplifier is protected against both overheating and short circuits. Because of the "soft" thermal protection (see the Design Features section above), it is highly unlikely that the amplifier will shut off because of thermal overload.

If your amplifier shuts down, turn off the system, wait for a few minutes, and turn the system on again. If the amplifier does not come on again:

Check the loudspeaker wires for shorts using an ohmmeter or continuity checker.

Check the LED indicators. If both are out, check the relay or fuse in the power line; if that fuse is blown, replace it with another fuse of identical type and value and try again.

If one of the LEDs is out, or if both are out and the power line fuse is not blown, check the chassis fuse(s) <4> and <5>. If blown, replace with the identical type (30-ampere). If a fuse blows again, call your dealer or Soundstream for service.

## SERVICE

Your Soundstream amplifier is protected by a limited warranty. Please read the warranty enclosed with the product.

Should any problem occur, contact your dealer, or you may contact Soundstream directly. **DO NOT** send your amplifier to Soundstream without first obtaining a return authorization number. This will facilitate repairs and will allow us to return your unit in the shortest possible time.

## **SPECIFICATIONS**

### **Power Output**

<b>2-channel</b>	<b>250 watts continuous per channel x 2 into 4 or 8 ohms, 20 Hz - 20 kHz</b>
<b>3-channel</b>	<b>250 watts continuous mono into 4 or 8 ohms, 20 Hz - 20 kHz; and 125 watts continuous per channel x 2 into 2 or 4 ohms, 20 Hz - 20 kHz</b>
<b>4-channel</b>	<b>125 watts continuous per channel x 4 into 2 or 4 ohms, 20 Hz - 20 kHz</b>
<b>Total harmonic distortion</b>	<b>&lt; 0.1%, 20 Hz - 20 kHz, at full rated power into 2, 4, or 8 ohms</b>
<b>Signal to noise</b>	<b>&gt; 100 dB</b>
<b>Damping factor</b>	<b>&gt; 200</b>
<b>IHF dynamic headroom</b>	<b>&gt; 2 dB</b>
<b>Maximum current draw</b>	<b>75 amps</b>
<b>Idle current draw</b>	<b>&lt; 5 amps</b>
<b>Input sensitivity</b>	<b>2% mV - 2.5 V, continuously variable</b>
<b>Input impedance</b>	<b>10k ohms</b>
<b>Linear subwoofer extension</b>	<b>6 dB/octave increase, variable hinge point 35 - 280 Hz</b>
<b>Dimensions</b>	<b>19-1/5" x 10-1/3" x 3-5/8"</b>